FINAL STATUS REPORT

for

NASA GRANT #NAG5-1073

Project Entitled

"OUTFLOWING GAS TOWARD THE SOUTH GALACTIC POLE"

Principle Investigator: Laura Danly

Reporting Period: 6/30/89 to 5/30/90

Space Telescope Science Institute
3700 San Martin Drive
Baltimore MD 21218

Operated by the
Association of Universities for Research in Astronomy, Inc.

Final Report for NASA grant #NAG5-1073

The research supported by this grant centered on understanding the nature galactic halo gas through the analysis of high resolution IUE data along sightlines that pass through the Milky Way halo. Specifically, this program addressed the question as to whether gas is found to be flowing *away* from the galactic disk in the direction of the south galactic pole. If this had indeed been found, it would have been in interesting contrast to the well-documented *inflow* of gas toward the north galactic pole.

Four shifts were requested and granted by IUE for the 11th observing period. Three shifts occurred during the 11th cycle during which time I observed three stars: HD 3175, Feige 29, and PHL 346. These three stars all lie at large distances above the plane toward the SGP and would have been most likely to detect outflow from halo gas.

Unfortunately, two of the stars that were observed were found to be unsuitable for interstellar studies because of their complicated stellar spectra: the absorption lines from species best suited to studying interstellar gas were swamped by stellar photospheric absorption.

The third star we observed, PHL 346, was found to have far too little flux, resulting in too small a signal-to-noise ratio to be of use for interstellar measurements. However, though essentially a null result from the interstellar perspective, this result is interesting because it most certainly *should* have been bright enough to provide adequate signal-to-noise for the study. This star was studied in great detail by Keenan and collaborators (ApJ **307**:694) who found it to be a normal Pop I object with a z-distance of 8.7 kpc. From this they concluded that the star *must* have been formed in the galactic halo. Our observation of the under-luminous ultraviolet flux suggests that perhaps PHL 346 is *not* a normal Pop I object, and may in fact be closer.

The fourth observing shift was scheduled *after* I had learned that my 12th episode proposal, "IUE Observations of Clouds in the Milky Way Halo" had been approved. I deemed it best to use the fourth shift to augment the scientific aims of the 12th episode proposal since there could be no possible statistical significance in observing the single remaining star, HD 177566. This star still remains unobserved, though it could very likely be an excellent target for subsequent halo study.

The funds from this grant were spent entirely in support of a research assistant, K.D. Kuntz, who has been tremendously helpful in developing IDL-based software for use in the analysis of IUE data. The software he developed has been and will continue to be extremely useful in subsequent IUE research. In the course of this program, we discovered some discrepancies in the data which, when compared to data from other projects, suggest some possible irregularities with the IUE wavelength calibration. A controlled study of these irregularities is now underway in collaboration with the IUE-RDAF (Regional Data Analysis Facility) personnel. We anticipate a publication in an upcoming IUE Newsletter, and possibly a refereed journal, if the results so merit.